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TECHNICAL NOTE

Bilateral Common Iliac Artery Stenosis: A Novel Technique for Deployment of Kissing Iliac Artery Stents

S.C. Lim [a,*], **M. Krauss** [a], **A. Khanafer** [a], **W. Ritter** [b]

[a] Christchurch Public Hospital, New Zealand
[b] Klinikum Nuernberg-Sued, Breslauer Str. 201, 90471 Nuernberg, Germany

Treatment for bilateral proximal iliac disease can be technically challenging, typically requiring simultaneous stent deployment to minimise complications. Up to three operators are required for exact simultaneous deployment of the balloons, contributing to increased operator time and costs.
This technical note demonstrates a novel approach to simultaneous stent deployment which uses readily available, inexpensive equipment and minimises the technical difficulty of simultaneous balloon deployment.

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BACKGROUND

Aorto-iliac occlusive disease is a common site of atherosclerotic disease causing lower limb intermittent claudication. Surgery (Aorto-bi-femoral bypass) was the gold standard treatment. However endovascular treatment has been accepted as an alternative approach.[1,2] The advances in endovascular intervention, the better imaging, the improved stent technology and the associated low morbidity and mortality of the procedure have made it the preferred approach.[3] This is particularly true for high risk patients.

Endovascular treatment for bilateral proximal iliac disease can be technically challenging with documented complications rates of 2–24%, including dissection, pseudoaneurysm, thrombosis, distal embolization, and access site hematomas.[4] One strategy to minimise these risks involves simultaneous stent deployment at the aortic bifurcation, and this has been shown to reduce such complications.[5] This however, increases the technical difficulty of the procedure and requires the presence of 3 operators to optimise the exact simultaneous deployment of the balloons.

We describe a novel approach to simultaneous stent deployment which uses readily available, inexpensive equipment and minimises the technical difficulty of simultaneous balloon deployment.

PROCEDURE

Vascular access to both femoral arteries and crossing of the aorto-iliac disease is performed using standard techniques. After possible pre-dilatation of the bilateral common iliac artery lesions, appropriate sized balloon-expandable stents are then placed across both diseased iliac artery segments. The balloons are then connected externally into a single circuit using a standard 3-way stopcock and a male-female converter allowing for the simultaneous and equal pressure insufflation via a single standard inflation device performed by one interventionist while a second operator holds both balloon catheters in the correct position. The technique can be used for both pre-dilatation and stent deployment and is demonstrated on Fig. 1 with equipment both connected and disconnected. Fig. 2 demonstrates the setup required for the standard approach for comparison.

DISCUSSION

This technique was initially developed by co-author Wolfgang Ritter in Germany and modified in Christchurch. To our knowledge it has not been described in the scientific literature.

We have used the procedure now in over 100 cases of bilateral aortoiliac artery disease in Christchurch Hospital with no adverse effects.

The technique is simple, easy to learn and needs inexpensive, easily available standard equipment. It guarantees an exact and simultaneous deployment of both stents without the need for a third operator, thus saving interventionist time and the need for a second inflation device.

We usually inflate the balloons with a standard BD Connecta stopcock up to a maximum of 12 atm/175 psi. Although the manufacturer states pressure resistance up to 3atm, we demonstrated no structural failures at the higher pressures.

* Corresponding author.
E-mail addresses: doctorstevenlim@gmail.com (S.C. Lim); Martin.Krauss@cdhb.health.nz (M. Krauss); Adib.khanafer@cdhb.health.nz (A. Khanafer); Wolfgang.Ritter@klinikum-nuernberg.de (W. Ritter).

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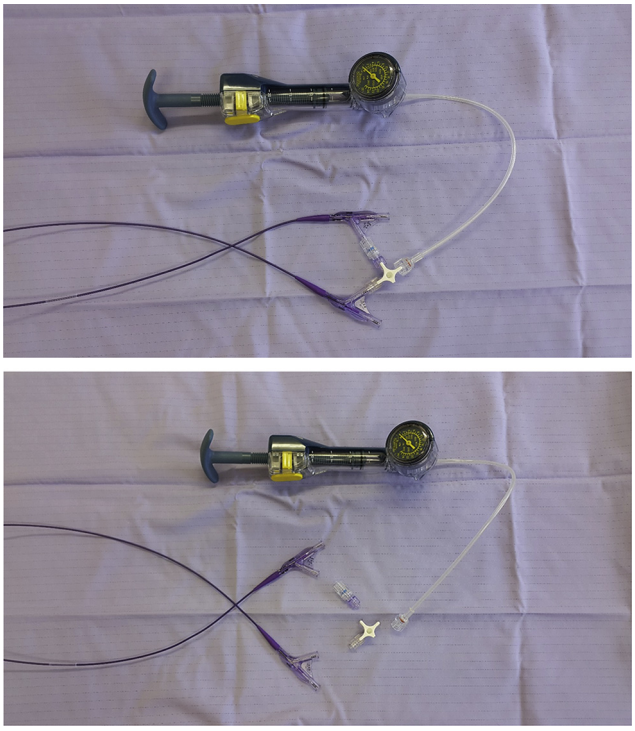

Figure 1. Demonstrates the equipment required for the novel technique both connected and disconnected. Note the 3-way stopcock and a male-female converter allowing for the simultaneous and equal pressure insufflation via a single standard inflation device.

Figure 2. Demonstrates the standard approach to inflation using 2 separate inflation devices.

Inflation of both balloons via a single pressure device sometimes leads to asymmetrical expansion of both balloons in the early phase of deployment, but due to a regular "dog boning" of the balloons at the beginning of inflation a stable position during the whole procedure is guaranteed.

The presence of a calcified lesion on one side and a soft plaque in the contralateral vessel requiring different minimum pressures for proper dilatation is in our experience only a theoretical problem. Inflation of the connected balloons slightly above the pressure needed for the more calcified lesion leads to a symmetrical configuration of both balloons/stents. Our experience demonstrates only a proof of concept, however given the relative inexpensive materials and technical expertise required we recommend this approach to simultaneous deployment of the kissing stent technique.

CONCLUSION

We describe a novel approach to simultaneous balloon angioplasty/stent deployment for bilateral aorto-iliac artery disease. The technique uses readily available, inexpensive equipment and significantly reduces the technical difficulty required.

CONFLICT OF INTEREST/FUNDING

None

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